On the distribution of *Idaea gelbrechti* Hausmann, 2003 in the Ibero-Maghrebian region (Geometridae: Sterrhinae)

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Abstract. *Idaea gelbrechti* Hausmann, 2003 was described from specimens collected in Morocco, and later on it was discovered in Spain in 2010. This species is very similar to *Idaea aversata* (Linnaeus, 1758) and it might be its sister species. Also, *I. gelbrechti* seems to be one of those species that very often remain undetected or overlooked in public and private collections. New records in Southeastern Iberian Peninsula confirm its Ibero-Maghrebian distribution in habitats characterised by the presence of pine and oak forest and mountain shrubland above 1,100 m in altitude, with a meso and supramediterranean climatic biotype. This species seems to be monovoltine with records from the beginning of July in lower altitude sites through the end of August in Sierra Nevada at 1,700 m.

Introduction

Idaea gelbrechti Hausmann, 2003 was described from specimens collected in Ifrane in the Middle Atlas (Morocco), at an altitude between 1,700 and 1,750 m in an area characterized by the presence of cedar and oak mixed forest. Müller (2010) cited its presence in the Iberian Peninsula from material collected in Sierra Nevada near Puerto de la Ragua above 1,840 m in an area of mountain shrubland surrounded by pine forest.

Hausmann (2004) indicated that *Idaea aversata* (Linnaeus, 1758) can be confused with *Idaea rubraria* (Staudinger, 1901), *Idaea straminata* (Borkhausen, 1794), and *Idaea deversaria* (Herrich-Schäffer, 1847) noting that certain forms of these three species are difficult to identify without observing the hairiness of the abdomen. From the systematic point of view, *I. gelbrechti* appears to be a sister species of *I. aversata*. Moreover, this species seems to be one of those that very often remain undetected or overlooked in collections due to lack of information about North African lepidopteran fauna.

According to Müller (2010), *I. gelbrechti* and *I. aversata* can be separated by observing the color pattern and shape of the wings, as well as other specific features. The background color of the wings of *I. gelbrechti* is paler than in *I. aversata*, varying from ochre colouration in specimens of the Middle Atlas to grayer in the Sierra Nevada ones. Also, specimens of *I. gelbrechti* from the Iberian Peninsula exhibit a dark area between the medial and postmedial lines, which is often the case in *I. aversata* as well. The differences between the two species based on genital structures, as noted by Hausmann (2003) and Müller (2010), are more evident in male genital structures than in the female ones.

The aim of the present study is to extend the recorded range of distribution of *I. gelbrechti* in western Mediterranean basin with new records and to add new biological data.

Material and Methods

Male and female genitalia were prepared using the classical method as described by Fibiger (1997) with minor modifications.

Material. **Spain**, Prov. Albacete: Nerpio, Plantón del Cobacho, 30SWH52, 1,100 m, 2♂ 26.vii.2011, leg. et coll. Palacios; Riopar, Arroyo de la Celada, 30SWH55, 1,100 m, 1♂ 9.vii.2005, leg. et coll. Lencina; Nerpio, Arroyo de Santiago, 30SWH41, 1,480 m, 2♂ 30.vii.2005, 1♂ 21.vii.2007, leg. et coll. Lencina. Prov. Granada: Puebla de don Fadrique, Sierra de la Sagra, 30SWH30, 1,380 m, 1♂ 30.vii.2011, leg. et coll. Abad, 1♂ and 2♀ 2.viii.2011, leg. et coll. Palacios & Albaladejo. Prov. Murcia, Moratalla: Bajil, 30SWH83, 1,280 m, 1♂ 19.vii.2009, leg. et coll. Abad; Puerto Alto, Cañada de la Cruz, 30SWH61, 1,435 m, 2♂ 25.vii.2009, leg. et coll. Abad & Albaladejo. Prov. Almería: Bayárcal, Posada de los Arrieros, 30SVG90, 1,700 m, 1♀ 16.viii.2009, 1♂ 17.viii.2009, 1♂ 23.viii.2009, leg. J. Gelbrecht, T. Drechsel, E. Schwabe & D. Stadie, coll. Gelbrecht.

Results

After Müller (2010) recorded *Idaea gelbrechti* in Spain, the specimens in private and public collections were checked paying special attention to those identified as *Idaea aversata* from southern Iberian Peninsula. *I. aversata* was recorded in southeastern Iberian Peninsula from Albacete (Lencina et al. 2009), Alicante and Castellón (Domínguez in litt. 1991), Cuenca (Ortiz et al. 2009, 2010b) and Murcia (Ortiz et al. 2010a). Specimens of *I. aversata* from this Iberian area were found in private collections of C. Abad, A. Albaladejo, F. Lencina, and J. L. Palacios, but not in collections from Museo Nacional of Ciencias Naturales in Madrid, Department of Zoology and Physical Antrophology from Murcia University, or in other private collections. The locations of new records are shown in Fig. 1.

Habitat preferences of *I. gelbrechti* are diverse but always located above 1,100 m in altitude. The mean altitude of the recording sites is 1,400 m. The original locality for description in Morocco is an area characterized by the presence of cedar and oak mixed forest (Hausmann 2003). In the Iberian Peninsula all records are located in the Baetic Mountains. The first record was cited from Sierra Nevada where the habitat is characterized by mountain shrubland with *Juniperus sabina* L. and *Juniperus communis hemisphaerica* (C. Presl) Nyman surrounded by *Pinus sylvestris* L. New records from Subbaetic Mountains are located in areas with mixed forest of *Pinus pinaster* Ait., *P. nigra mauretanica* Maire & Peyerimh, *Quercus rotundifolia* Lam., *Q. faginea* Lam., and *Acer opalus granatense* (Boiss.), and riparian forest (*Populus* spp. and *Salix* spp.) with shrubland (*Genista* spp., *Berberis* spp., *Cytisus* spp., *Lavandula* spp., *Prunus* spp., etc); in Bajil there is an oak forest of *Quercus rotundifolia* Lam. with typical undergrowth (*Arbutus unedo* L., *Phillyre angustifolia* L., *Pistacea* spp., *Lonicera* spp., etc). In all cases no grasses or cultivated land were found in the vicinity. This Subbaetic Mountainous region is characterized by meso and supramediterranean climatic biotype.

Fig. 1. Map of distribution of *Idaea gelbrechti* in the Western Mediterranean Basin; **1**. Type localitiy; **2**. First record in Iberian Peninsula; **3**. New records. Map source: The Earth Observatory located at NASA Goddard Space Flight Center.

I. gelbrechti seems to be a monovoltine species with records from the beginning of July in lower altitude sites (1,100 to 1,480 m) to the end of August in Sierra Nevada at 1,700 m, without records at the Sierra Nevada site from March to the beginning of July and from September to November (J. Gelbrecht, pers. comm.).

Discussion

The presence of new records of *Idaea gelbrechti* in the Baetic Mountain System confirms that this species has an Ibero-Maghrebian distribution as suggested by Müller (2010).

Interestingly, *I. gelbrechti* has not been recorded in other mountainous areas of the southern Iberian Peninsula, for example, the ones located in Murcia (Sierra Espuña:

Calle et al. 2007; Sierra Pila and Sierra Carrascoy: unpublished data) and Almería (Sierra de María: unpublished data), where intensive sampling has been carried out for a long time. This absence may be due to a more thermophilus regime of these last-mentioned regions – *I. gelbrechti* seems to prefer colder biotopes and is thus found in other mountains of southern Iberian Peninsula such as Sierra Baza, Sierra de Filabres, and Sierra de Ronda, and possibly also in Rif and Tellian Mountains, where similar climatic conditions are met.

In relation to morphological characters, Müller (2010) notes that specimens of *I. gelbrechti* from the Iberian Peninsula exhibit a dark area between the medial and postmedial lines, although Gelbrecht (pers. comm.) bred 42 specimens of *I. gelbrechti* from the locality of the first Iberian record from a single female and the result was 33 specimens with this dark area between the medial and postmedial lines, whereas nine specimens did not exhibit this character. This finding reinforces the necessity of using the genital structures to differentiate specimens of *I. gelbrechti* as Hausmann (2003) and Müller (2010) suggested.

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